

REMARKS

The application has been carefully reviewed in light of the Office Action dated November 14, 2003. Claims 1, 19, 24, 35 and 39 have been amended. Claims 1-39 are pending in the present application. Applicant reserves the right to pursue the original claims and other claims in this application and in other applications.

Claims 1-39 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Addiego, U.S. Patent Number 5,917,588 (hereinafter "Addiego") in view of Levy et al., U.S. Patent Number 4,579,455 ("Levy"). The rejection is respectfully traversed and reconsideration is respectfully requested.

Claim 1 recites a method of operating an inspection apparatus to inspect a device. The method comprises the step of "selecting at least two of the plurality of displayed images based on an input of desired images to be inspected by a user of the inspection apparatus." The method also comprises "deriving a spatial relationship between the selected images; and forming a pattern to be recognized on the device from the selected images and the derived spatial relationship."

Addiego shows an inspection system that determines, locates and classifies defects on a wafer surface. The results of the inspection are printed, transmitted, and/or displayed on a system monitor. During wafer production, the Addiego system continuously inspects specimen wafers and looks for defects present on each specimen wafer. If defects are found, the system either alerts an operator or uploads the defect information to a host computer. The Addiego system determines the presence of defects from acquired image data of a specimen wafer by analyzing the difference image of two adjacent reticle fields (col. 8, lines 60-63). The Addiego system always analyzes the difference image of two adjacent reticle fields, neither of which are selected by a user.

The Office Action acknowledges that Addiego fails to teach or suggest selecting at least two of the plurality of displayed images based on an input by a user of the inspection apparatus. To overcome this deficiency, the Office Action combines Addiego with Levy. Levy shows an inspection system 20 in which photomask 26 is inspected for defects by comparing pixel representations of two duplicate die patterns of the photomask. Defects are identified at those locations where the two pixel representations do not match. The pixel representations are formed by a combination of optical and electronic means. See Column 4, lines 47-52.

Levy states that "the inspection operation is continuously performed as the pixel representations are formed. Memories 56 and 58 are first-in-first-out (FIFO) type memory circuits that at any one point in time contain only a small fraction of the total pixel representations of the die patterns. In the preferred embodiment of the present invention, left and right pixel memories 56 and 58, respectively, contain pixel representations for the seven most recent scans of left and right detectors 48 and 50, respectively." See Column 5, lines 21-30. In addition, Levy states "inspection parameters may be prerecorded and input to microprocessor 64 via a tape cassette 74, or may be input manually through manual controls 76. Instructions to the operator or visual display of the photomask may be displayed on a CRT display 78. Defect data resulting from the inspection operation is output to the tape cassette." See Column 5, lines 52-58.

The Office Action fails to establish a prima facie case of obviousness of the subject matter of claims 1-39. Courts have generally recognized that a showing of a prima facie case of obviousness necessitates three requirements: (i) some suggestion or motivation, either in the references themselves or in the knowledge of a person of ordinary skill in the art, to modify the reference or combine the reference teachings; (ii) a reasonable expectation of success; and (iii) the prior art references must teach or

suggest all claim limitations. See e.g., In re Dembiczak, 175 F.3d 994 (Fed. Cir. 1999); In re Rouffet, 149 F.3d 1350, 1355 (Fed. Cir. 1998); Pro-Mold & Tool Co. v. Great Lakes Plastics, Inc., 75 F.3d 1568, 1573 (Fed. Cir. 1996). In this case, the prior art references do not teach or suggest all of the limitations of claim 1.

That is, Addiego and Levy fail to teach or suggest “selecting at least two of the plurality of displayed images based on an input of desired images to be inspected by a user of the inspection apparatus” and “deriving a spatial relationship between the selected images; and forming a pattern to be recognized on the device from the selected images and the derived spatial relationship.” According to the present invention, user selected images of an object being inspected are used as a pattern to be recognized during a pattern recognition analysis to detect defects on the object. As shown at step 212 in Fig. 5 of the present application, the user selects at least one image of the object. Once selected, a relationship between the images is determined (step 214).

This feature of the claimed invention allows the user to select the images to be searched so undesirable images will not become part of the recognition process, which is something that neither the Addiego or Levy systems can do because neither reference allows a user to select any images to be used for the pattern recognition process. In Addiego, a difference image comprised of adjacent images is always used. There is no feature for a user to select the images used for pattern recognition (as recited in the claims). In Levy, the system only corrects defect patterns of two pixels that are equivalently positioned. See Column 8 lines 29-32. There is no teaching in either reference of “selecting at least two of the plurality of displayed images based on an input of desired images to be inspected by a user of the inspection apparatus” and “deriving a spatial relationship between the selected images; and forming a pattern to be recognized on the device from the selected images and the derived spatial relationship.”

Similarly, claim 19 recites a method of inspecting a semiconductor wafer having objects formed therein, said method comprising *inter alia* the steps of “selecting at least two of the plurality of displayed images based on at least one selection of a desired image by a user of an inspection apparatus” and “deriving a relationship between the selected images; and forming a pattern to be recognized on the wafer from the selected images and the derived relationship.”

Claim 23 recites a method of inspecting a semiconductor device having objects formed therein, said method comprising *inter alia* the step of “forming a pattern to be recognized on the device from the selected images and a spatial relationship between the images, wherein features that are not to be included in the pattern to be recognized are filtered out during said selecting step.”

Claim 24 recites a processor with “an input device to be manipulated by a user for selecting desired features of an image to be inspected” for “inputting at least two user selected images from the input device, deriving a spatial relationship between the user selected images and forming a pattern to be recognized on the manufacturing device from the user selected images and the derived spatial relationship.”

Claims 35 and 39 recite an inspection apparatus for use in inspecting a semiconductor wafer, said apparatus comprising *inter alia* “an input device for use by a user of the apparatus for selecting desired features of an image to be inspected.”

Addiego and Levy fail to teach or suggest the claimed feature of “selecting at least two of the plurality of displayed images based on an input of desired images to be inspected by a user of the inspection apparatus,” much less the feature of “forming a pattern to be recognized on the device from the selected images and a spatial relationship between the images, wherein features that are not to be included in the

pattern to be recognized are filtered out during said selecting step” as recited in claims 19 and 23. In addition, Addiego and Levy fail to teach or suggest “an input device to be manipulated by a user for selecting desired features of an image to be inspected” or “an input device for use by a user of the apparatus for selecting desired features of an image to be inspected” as recited in claims 24, 35 and 39. Levy merely allows a user to input inspection parameters manually into a microprocessor 64. Levy fails to teach or suggest selecting desired features of an image.

“The statutory standard for the ultimate determination of obviousness provides that a claimed invention is unpatentable if the differences between it and the prior art ‘are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art.” Brown & Williamson Tobacco Corp. v. Phillip Morris Inc., 229 F.3d 1120, 1156 (Fed. Cir. 2000). According to such a standard, a determination of obviousness based on a combination of Addiego and Levy cannot be sustained because Addiego and Levy, whether considered alone or in combination, fail to teach or suggest the limitations of claims 1, 19, 23, 24, 35 and 39. Accordingly, the rejection of claims 1, 19, 23, 24, 35 and 39 should be withdrawn.

Claims 2-18 depend from claim 1, claims 20-22 depend from claim 19, claims 25-34 depend from claim 24 and claims 36-38 depend from claim 35. Claims 2-18, 20-22, 25-34 and 36-38 are allowable along with claims 1, 19, 24 and 35 for at least the reasons set forth above and on their own merits. As set forth above, the cited references fail to teach, suggest or disclose these claim elements. The rejection should be withdrawn and the claims allowed.

In view of the above, each of the presently pending claims in this application is believed to be in immediate condition for allowance. Accordingly, the Examiner is respectfully requested to pass this application to issue.

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Respectfully submitted,

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